When NPP's Ozone Mapping and Profiler Suite (OMPS) begins monitoring how much ozone is in our atmosphere, one of the two sensors will be pushing the scientific envelope.

Built by Ball Aerospace & Technologies Corp., OMPS will host a newly designed limb sensor to look beyond the aft edge of the spacecraft to obtain vertical profiles of ozone in the Earth's stratosphere. This sensor complements the nadir pointing sensor that is based on a heritage design that has been used on other satellites to obtain ozone measurements.

The nadir sensor operates in the ultraviolet (UV) portion of the spectrum and the limb sensor operates in the UV, visible, and near infrared (IR) portion of the spectrum. Full production of the first flight unit is underway with delivery to NPP scheduled for mid-2005.

OMPS replaces the Solar Backscatter Ultraviolet instrument (SBUV/2), (NOAA-M POES) also built by Ball, as well as the Total Ozone Mapping Spectrometer (Nimbus-7). Like the older instruments, the nadir sensor looks down through the atmosphere to measure the total ozone column beneath it. The limb sensor measures ozone in three separate cross track fields of view at altitudes from 8 km to 60 km by looking behind the spacecraft at the limb of the Earth.

Both instruments map the stratospheric ozone hole blamed on the use of chlorofluorocarbon coolants, aerosol propellants and solvents. OMPS ozone data will be used to help determine if these synthetic chemicals are affecting the Earth's climate and its habitability. Ozone in the stratosphere shields the amount of dangerous ultraviolet radiation that reaches the Earth's surface filtering dangerous ultraviolet rays that may cause skin cancer, sunburn, gene mutation and cataracts in humans. Ultraviolet rays may also damage crops and aquatic ecosystems. And while the ozone hole is centralized over Antarctica, some dilution of ozone still occurs across the globe.

Specifically, OMPS will collect total column and vertical profile ozone data, and continue the daily global data produced by the current ozone monitoring systems, but with higher fidelity. Current instruments used to monitor ozone provide either limited vertical resolution like the SBUV or limited coverage like the Stratospheric Aerosol and Gas Experiment, (METEOR-3M, ISS). Ball is also building the OMPS suite to fly on the first NPOESS spacecraft, and simultaneously building the NPP spacecraft, a modified Ball Commercial Platform 2000, successfully flown on QuickBird, QuikSCAT and ICESat.

The collection of ozone data contributes to fulfilling the U.S. treaty obligation to monitor the ozone depletion for the Montreal Protocol to ensure no gaps on ozone coverage.